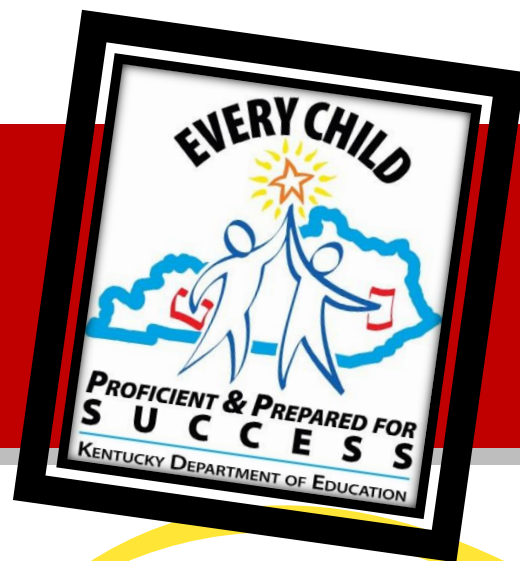


# Math Interventions Update

*A Monthly Update for the Latest in Math Interventions*

February 2013

Volume 1 – Issue 3



## Intervention Talk

Last month, I shared strategies to help you identify students who may benefit from intervention. The following strategies will help you address the needs of your students.

**Use Small Groups or Student Pairs:** Having your students work in small groups or in student pairs is a beneficial instructional strategy for struggling students. Students who need intervention may be insecure about their abilities and consequently unmotivated. Small groups or student pairs can be less intimidating for struggling students. Students may be more likely to ask questions and admit confusion when working in small groups or with another student. Students can also benefit from explanations from fellow students. Often these explanations can make more sense to a student than one offered from an instructor. This instructional strategy can enable teachers to spend time listening to and observing students as they work on assignments. The grouping of students should be carefully thought out ahead of time to best address the needs of struggling students. For many cooperative group activities, random assignments are fine, but in the case of students in need of intervention, you will want to form groups or pairs that will be conducive to discussion and support.

**Differentiate Instruction:** When it comes to addressing students who need intervention, differentiated strategies may improve learning. Many students who need intervention struggle to learn concepts because they may not be able to grasp abstract concepts. Vary your instructional techniques to best address the learning styles of your struggling students. Some students may not understand a concept when illustrated symbolically, but may be able to understand it when it is illustrated concretely, either via models, manipulatives, or technology. The more varied instructional strategies you incorporate into your lessons, the more likely you will be able to reach all students.

**Incorporate Multiple Representations:** Many middle and upper grade students require intervention because they are not able to grasp the abstract concepts of higher levels of mathematics. The use of multiple representations can help address these needs. When introducing a new concept, use as many representations of the concept as you can: use manipulatives and models, real-life examples, technology, and symbolic representations.

**Emphasize Real-Life Applications:** Help students see the value and application of the mathematics they are studying by presenting as many real-life applications as you can. By relating a math topic to something relevant in a student's life, you can help increase a student's interest in the topic, and help make mathematics more meaningful. This can be especially beneficial for struggling students who may not be able to see how the math they are studying has any relevance to their daily lives. Many real-life applications of mathematics can make the content more interesting to struggling students. By increasing their interest, you can help increase their motivation.

**Consider Seating Arrangements:** Sometimes intervention can be as simple as where your students sit in your classroom. Sometimes physical placement can get overlooked once students reach the middle and upper grades. Strategically seat your struggling students in the best location in your classroom, where they feel most comfortable, can focus on the lesson, and may benefit from a helpful student peer nearby. *(Note: Seating arrangements are not formal interventions, but can help with Tier 1 issues.)*

Resource: [http://www.glencoe.com/sec/teachingtoday/subject/intervention\\_strategies.phtml](http://www.glencoe.com/sec/teachingtoday/subject/intervention_strategies.phtml)

Department of Education  
Office of Next-Generation Learners  
Division of Learning Services  
Differentiated Learning Branch  
Division Director: Johnny Collett  
Branch Manager: April Pieper  
Mathematics Intervention Consultant: Pamela Pickens

# Mathematics Achievement Fund (MAF)

## Monthly Update/Focus

**Attendance Data and Survey** – Thanks so much for taking the time to complete the attendance data report and survey. There was a little confusion about the reports, but part of the grant requires that schools maintain and report progress-monitoring on participating students to the Kentucky Department of Education and the Kentucky Center for Mathematics. A similar report and survey will also be required at the end of the school year for KDE. Data from the report and survey will be shared in next month's newsletter.

**School Visits** – When I am out in schools and districts working with other projects and initiatives, I will try to make some stops to see you in action. I would love to see all the great things that you are doing as a result of the grant. I would also love to hear from you about ways I can help. As I am planning my calendar, I will let you know in advance of a possible visit.

**KCM Conference** – I will be attending the conference this year. I will try to meet and talk with each of you. I would love to put faces with all of the names. Please feel free to look me up as well.

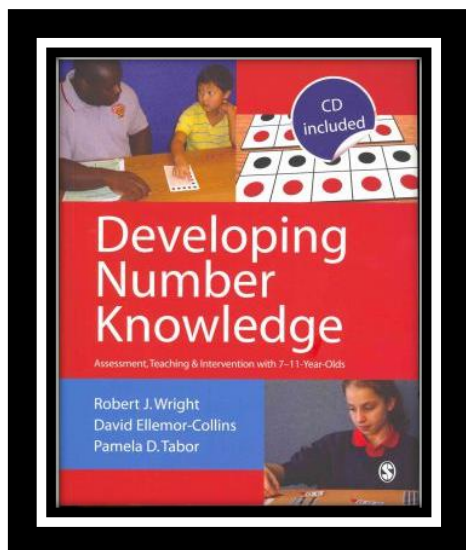
**Grant Requirements** – Please review the Mathematics Achievement Fund handbook to make sure that your school is adhering to the requirements of the grant. I have had several questions about how additional funds may be spent. I have also had questions and concerns about the students receiving services. If you are ever unsure of the requirements, please feel free to email me or call me at any time.

## Recommended Reading

### *Developing Number Knowledge: Assessment, Teaching and Intervention with 7-11 year olds*

by Robert J Wright, David Ellemor-Collins and Pamela D Tabor (Dec 6, 2011)

The book offers a coherent, up-to-date approach emphasizing computational fluency and the progressive development of students' mathematical sophistication. The book is organized in key domains of number instruction, including structuring numbers 1 to 20, knowledge of number words and numerals, conceptual place value, mental computation, written computation methods, fractions, and early algebraic reasoning.



# Mathematical Practice of the Month

To emphasize the Mathematical Practices, the CCSS gives them their own distinct section, but they are not to be thought of as a separate skill set to be handled in special lessons or supplements. The intent is that these *essential mathematical habits of mind and action* pervade the curriculum and pedagogy of mathematics, K–12, in age-appropriate ways.

## 3 - Construct viable arguments and critique the reasoning of others.


Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Resource: Common Core State Standards Initiative <http://www.corestandards.org/>

## Anchor Charts for this Mathematical Practice




Resource: Jordan School District <http://elemmath.jordandistrict.org/files/2012/05/Standard-31.pdf>

**Construct viable arguments and critique the reasoning of others.** Mathematical Practice 3






**I can explain my thinking and consider the mathematical thinking of others.**

I can **explain my strategy** using...


- objects 
- drawings 
- actions 

I can **compare my strategy** with others by...

- listening 
- asking questions 
- making connections between my own thinking and others 


Left – K-1  
Right – 2-3  
Bottom – 4-5

**Construct viable arguments and critique the reasoning of others.** Mathematical Practice 3





**I can explain my thinking and respond to the mathematical thinking of others.**


I can **explain my strategy** using...

- objects, drawings, and actions 
- examples and non-examples
- contexts

I can **compare strategies** with others by...

- listening 
- asking useful questions 
- understanding mathematical connections between strategies

**Construct viable arguments and critique the reasoning of others.** Mathematical Practice 3



**I can make logical arguments and respond to the mathematical thinking of others.**

I can **make and present arguments** by...

- using objects, drawings, diagrams and actions
- using examples and non-examples
- relating to contexts

I can **analyze the reasoning of others** by...

- listening
- asking and answering questions
- comparing strategies and arguments

# Spotlight on CIITS

## What is CIITS?

CIITS stands for the Continuous Instructional Improvement Technology System – a tool designed to pull standards, instructional materials, lesson plans, assessments, data and professional development all together into an integrated online resource. CIITS is a one-stop shop that provides Kentucky educators with the resources aligned to standards that support highly effective teaching and learning in their classrooms, schools and districts.

## Featured Link this Month: SAS Curriculum Pathways

SAS delivers online curriculum resources with a proven impact on increasing student learning and teacher effectiveness. SAS Curriculum Pathways is designed to enhance student achievement and teacher effectiveness by providing Web-based curriculum resources in all the core disciplines.

### Benefits:

- Targets higher-order thinking skills
- Integrates content and technology in the classroom
- Presents math concepts in a clear, concise and engaging manner
- Employs a learner-centered approach
- Integrates various instructional strategies
- Incorporates formative as well as summative assessments



## Dates to Remember

**February 25<sup>th</sup> - 27<sup>th</sup>** – Annual KCM Conference, Lexington, Kentucky

**April 17<sup>th</sup> – 20<sup>th</sup>** – NCTM Annual Meeting and Exposition, Denver, Colorado



## School-Wide Strategies for Managing Mathematics

**Math Computation: Boost Fluency Through Explicit Time-Drills** (Rhymer, Skinner, Jackson, McNeill, Smith & Jackson, 2002; Skinner, Pappas & Davis, 2005; Woodward, 2006). Explicit time-drills are a method to boost students' rate of responding on math-fact worksheets. The teacher hands out the worksheet. Students are told that they will have 3 minutes to work on problems on the sheet. The teacher starts the stop watch and tells the students to begin work. At the end of the first minute in the 3-minute span, the teacher 'calls time', stops the stopwatch, and tells the students to underline the last number written and to put their pencils in the air. Then students are told to resume work and the teacher restarts the stopwatch. This process is repeated at the end of minutes 2 and 3. At the conclusion of the 3 minutes, the teacher collects the student worksheets. TIPS: Explicit time-drills work best on 'simple' math facts requiring few computation steps. The drills are less effective on more complex math facts. Also, a less intrusive and more flexible version of this intervention is to use time-prompts while students are working independently on math facts to speed their rate of responding. For example, at the end of every minute of seatwork, the teacher can call the time and have students draw a line under the item that they are working on when that minute expires.

Article Excerpt from *Intervention Central*. Read the entire the article at

<http://www.interventioncentral.org/academic-interventions/math/school-wide-strategies-managing-mathematics>

## Wonderful Websites

- **Effective Strategies for Teaching Students with Difficulties in Mathematics** - Based on meta-analyses of more than 50 studies, this research brief from the National Council of Teachers of Mathematics reviews six aspects of instruction that have been found to be consistently effective in teaching students who have difficulties with mathematics: systematic and explicit instruction, think-alouds, peer-assisted learning, and formative assessment data.  
[http://www.nctm.org/uploadedFiles/Research\\_News\\_and\\_Advocacy/Research/Clips\\_and\\_Briefs/Research\\_brief\\_02\\_-\\_Effective\\_Strategies.pdf](http://www.nctm.org/uploadedFiles/Research_News_and_Advocacy/Research/Clips_and_Briefs/Research_brief_02_-_Effective_Strategies.pdf)
- **Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics: A Guide for Teachers** - This guide from the Center on Instruction describes seven effective instructional practices for teaching mathematics to K–12 students with learning disabilities that were identified in the Center's synthesis of intervention research, and also incorporates recommendations from "The Final Report of The National Mathematics Advisory Panel".  
<http://www.centeroninstruction.org/files/Mathematics%20Instruction%20LD%20Guide%20for%20Teachers.pdf>
- **Examples of Math Interventions** – Provides a list of strategies by area of concern or struggle for students. [http://jenny lind.mpls.k12.mn.us/math\\_intervention\\_ideas](http://jenny lind.mpls.k12.mn.us/math_intervention_ideas)